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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/545,447	04/07/2000	Richard W. Citta	7163	9913

7590 07/29/2003

Jack Kail
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EXAMINER

WILLIAMS, DEMETRIA A

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 07/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/545,447

Applicant(s)

CITTA ET AL.

Examiner

Demetria A. Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,9,15-18,24-28 and 34-38 is/are rejected.
- 7) ☒ Claim(s) 5-8,10-13,19-23 and 29-33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 15, 26, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams et al (“Williams”).

3. Regarding claim 15, Williams discloses a method of equalizing a signal having both data and ghost components comprising processing the main and ghost signals along multiple paths by complex multiplying the data by equalizer coefficients and adding the adjusted data to provide a signal wherein ghost components have been cancelled (see generally figures 1 and 2; column 4, lines 27-65). Delay elements are used in all but one of the paths to shift the data.

4. Regarding claim 26, Williams discloses an equalizer comprising multiple processing paths, shifters in all but one of the paths embodied as delay elements, filters for applying coefficients to the data, and an adder for adding the outputs of the paths to provide a signal wherein ghost components have been cancelled (see generally figures 1 and 2; column 4, lines 27-65).

5. Regarding claim 38, Williams illustrates, in figure 1, an equalizer having greater than four paths.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al ("Williams") in view of Zheng.

9. Regarding claim 1, Williams discloses a method of equalizing a signal comprising shifting a series of input data by using delay elements, complex multiplying the shifted data by equalizer coefficients, and adding the adjusted data to provide a signal wherein ghost components have been cancelled (see generally figures 1 and 2; column 4, lines 27-65). Williams does not specify whether the input data is shifted to the left or right. Zheng discloses an equalizer having a timing recovery component that causes a left or right shift of the data in order to keep the symbol rate near that of the transmitter (see generally column 5, lines 1-10;

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column 7, lines 13-30; column 9, lines 7-12). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Williams to include shifting the data either to the left or to the right, in order to keep the receiver timing synchronized to that of the transmitter.

10. Regarding claim 2, Zheng further discloses down-sampling the input signals after they have been shifted (see generally column 8, lines 20-33).

11. Claims 3, 4, 9, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams and Zheng as applied above, and further in view of Yamasaki et al ("Yamasaki").

12. Regarding claims 3, 4, and 14, in the embodiment described above in the Williams patent, there is no explicit mention of transforming the data to the frequency domain, which involves applying coefficients to the data prior to shifting. However, it would have been obvious to one of ordinary skill in the art to transform the data to the frequency domain, because as Yamasaki discloses, the effects of noise can be readily seen in the frequency domain (see generally column 6, lines 29-31) and therefore corrected for.

13. Regarding claim 9, Zheng further discloses down-sampling the input signals after they have been shifted (see generally column 8, lines 20-33).

14. Claims 16 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams in view of Zhang. Williams discloses all of the elements as described above in reference to claims 1 and 15, but does not specify down sampling the data. Zheng discloses and equalizer wherein the data is down-samples following being shifted (see generally column 8, lines 20-33). It would have been obvious to one of ordinary skill in the art to down-sample the

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data signals, as disclosed by Zheng, in order to ensure the signal is within the appropriate frequency range.

15. Claims 17, 18, 24, 25, 27, 28, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams and Zheng as applied above, and further in view of Yamasaki et al (“Yamasaki”).

16. Regarding claims 17, 18, 25, 27, 28, and 34, in the embodiment described above in the Williams patent, there is no explicit mention of transforming the data to the frequency domain, which involves applying coefficients to the data prior to shifting. However, it would have been obvious to one of ordinary skill in the art to transform the data to the frequency domain, because as Yamasaki discloses, the effects of noise can be readily seen in the frequency domain (see generally column 6, lines 29-31) and therefore corrected for.

17. Regarding claim 24, Zheng further discloses down-sampling the input signals after they have been shifted (see generally column 8, lines 20-33).

18. Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al (“Williams”) in view of Zheng. Williams discloses all of the elements as described above in reference to claim 26, but does not specify whether the input data is shifted to the left or right. Zheng discloses an equalizer having a timing recovery component that causes a left or right shift of the data in order to keep the symbol rate near that of the transmitter (see generally column 5, lines 1-10; column 7, lines 13-30; column 9, lines 7-12). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Williams to include shifting the data either to the left or to the right, in order to keep the receiver

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timing synchronized to that of the transmitter. Further, choosing an odd value for the number paths is a matter of design choice and is given no patentable weight as claimed in claim 36.

Allowable Subject Matter

19. Claims 5-8, 10-13, 19-23, and 29-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record does not teach the characteristics of the pre-processing coefficients as claimed by the applicants.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Demetria A. Williams whose telephone number is (703) 305-4078. The examiner can normally be reached on Monday - Friday, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (703) 305-4378. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

daw
July 24, 2003


TEMESGHEN GHEBRETINSAE
PRIMARY EXAMINER